SECTION 93

RADIO AND COMMUNICATION EQUIPMENT

93.1 REFERENCES

(93A) Code of Federal Regulations - 46 CFR Sub-chapter J

(93B) **VOLUME V**, *OWNER - FURNISHED EQUIPMENT*

93.2 INTRODUCTION

This Section outlines the Contractor Design and Provide requirements for the Vessel's radio and communication equipment.

For WSF Fleet-wide Standardization purposes, End No. 1 of the Vessel shall always be considered the bow, and this designation shall delineate port and starboard, fore and aft wherever they are addressed in the Technical Specification.

93.3 GENERAL

Specific references to some Vessel equipment are intended to define WSF requirements and are not meant to be limiting. The requirements of the Authoritative Agencies shall be met in all cases.

All equipment shall be provided that is required by the Authoritative Agencies, as well as the equipment described herein. Each piece of equipment shall be installed according to the manufacturer's recommendations.

All radio and communication systems cable shall be shielded or inherently immune to EMI (electromagnetic interference) or RFI (radio frequency interference).

All equipment shall be FCC type approved.

Allowances for additional equipment to be installed in the future shall be provided in the Pilothouse. These shall be indicated on the Vessel's arrangement drawings.

The Contractor is advised that it is wholly responsible for ensuring that the design and installation of Radio equipment is complete and adequate for the service intended and that it complies with Reference (93A), 46 CFR §62, and 47 CFR §80.

For cable installation, identification and termination, see Section 87 of the Technical Specification.

Provide "BLACK" phenolic nameplates with "WHITE" lettering in accordance with Section 24 of the Technical Specification for phenolic nameplates.

See the *Antenna Identification Nameplates* Subsection of Section 24 of the Technical Specification.

Refer to Section 92 of the Technical Specification for systems interface requirements.

WSF will require 120 day lead time, after receiving written a request from the Contractor, for deliver of the Owner - Furnished Equipment (OFE) equipment.

The Contractor shall provide for, as part of his bid, coordination services, schedule, material, and support of the WSF Communications Technician required set up, light off, adjustment, and testing of all communication system equipment **after** all Shipyard equipment and OFE provided equipment and material is installed, operational, satisfactorily tested, and approved

by the WSF Representative, for set up, light off, and adjustment testing for each Vessel. All system coordination services shall be identified and scheduled as part of the *Master Construction Schedule (MCS)* Subsection in Section 100 of the Technical Specification.

93.4 VHF RADIOS

Install four (4) Owner - Furnished Equipment (OFE) SEA-157 VHF radios, two (2) in each Pilothouse, and two (2) Owner - Furnished Equipment (OFE) 12 Vdc VHF radio power distribution panels, one (1) in each Pilothouse. VHF radios shall be mounted, in accordance with the methodology standard on other WSF Fleet Vessels. Mount the radios on shelving located between the two (2) navigation radars on the starboard side of each Pilothouse, and as approved by WSF Representative. WSF has provided a radio wiring drawing as part of Reference (93C). The Contractor shall provide all foundations, brackets, interconnecting cable, and connection boxes.

Provide wiring, cabling, and installation for four (4) OFE Motorola TSN-6000A overhead radio speakers. Install two (2) in each Pilothouse overhead, (one (1) per VHF radio), as directed by the WSF Representative.

For WSF Fleet-wide Standardization purposes, provide four (4) MORAD Model HD 156 VHF antennas, two (2) at each End of the Vessel and mounted atop the Pilothouses. Locate the antenna bases as near the port and starboard after edges of the Pilothouse tops as is structurally feasible, and as free from interference as is practical, in order to maximize antenna separation. Provide RG-213U co-axial cable from each of the antenna to the corresponding VHF radios. Antennas shall be mounted using MORAD M6 mounts with a MORAND V10 stanchion.

For WSF Fleet-wide Standardization purposes, provide two (2) NEWMAR Model 115-12-20A power supplies and install one (1) in each Pilothouse, or in the Electrical Distribution Room located behind each Pilothouse, as near to the 12 Vdc VHF radio power distribution panels as is practical. Installation of these power supplies shall provide unhindered access for removal, operation, and control. Power supplies shall be connected to power by a twist lock plug (not hard wired). This power supply shall feed the radio panel and also provide power to maintain charge on the VHF radio battery bank located on the weather deck aft of each Pilothouse.

Provide shelving, or other mountings of appropriate dimension and configuration for the VHF communications equipment in the vicinity of the starboard radars.

Provide for the installation of two (2) Owner - Furnished Equipment (OFE) 12 Vdc battery power distribution panels, one (1) in each Pilothouse, or in the Electrical Distribution Rooms located behind each Pilothouse as approved by the WSF Representative. Panel size will be approximately
12" × 15¾" × 9" deep.

Coordinate the design, installation and testing of the 12 Vdc power distribution panels and the VHF radio systems with the WSF Communications Technician through the WSF Representative.

Provide VHF communication circuits antenna cable, and power cable, foundations, hangers, connectors, junction boxes, and other items and devices as are required to make a complete, functional, and fully operational VHF communications system.

Provide electrical power and access to the radio installation prior to Dock Trials for an WSF Communications Technician to perform field checks and adjustments.

The Contractor shall inform the WSF Representative no less than fourteen (14) days prior to the need for the WSF Communications Technician's services.

93.5 UHF RADIOS

Install two (2) Owner - Furnished Equipment (OFE) E.F. JOHNSON 242-9756-111 800 MHZ Transceivers with remote Control Head in each Pilothouse located on shelving between the two (2) navigation radars, near the VHF radios and as approved by the WSF Representative. WSF will provide (2) JOHNSON remote control head interconnect cables, (1) for each radio.

For WSF Fleet-wide Standardization purposes, provide (2) MAXRAD MFB 8135 800 MHZ antennas mounted on a five (5) foot stanchions. Mount one (1) antenna on each End of the Vessel atop the Pilothouse. Locate the antennas as free from interference as is practical, in order to maximize antenna separation. For WSF Fleet-wide Standardization purposes, provide TIMES microwave LMR 400 coaxial cable from each antenna to the corresponding 800 MHZ radio.

Provide circuit cable, power cable, foundations, hangers, connectors, junction boxes, and other items and devices as are required to make a complete, functional, and fully operational UHF communications system.

93.6 COMMUNICATIONS RECEIVER

Provide two (2) YAESU FRG-100 Communications, or equal, receivers. Install one (1) receiver on the desk of each Pilothouse. Provide power for these receivers from the final emergency power system. Provide a 15 foot whip antenna on the centerline aft of the mast with its base at the upper platform level. Provide an impedance matching device and RG-214/u co-axial cable down to the communications receiver.

Provide circuit cable, power cable, foundations, hangers, connectors, junction boxes, and other items and devices as are required to make a complete, functional, and fully operational communications system.

93.7 ENGINEER'S OPERATING SPACE CELLULAR TELEPHONE

Provide and install an Engineer's cellular telephone 4-line system as set forth in Section 95 of the Technical Specification. Certain equipment for this system will be OFE equipment as set forth in Section 95 of the Technical Specification.

93.8 PILOTHOUSE CELLULAR TELEPHONES

Provide and install a Pilothouse cellular telephone 4-line system as set forth in Section 95 of the Technical Specification. Certain equipment for this system will be OFE equipment as set forth in Section 95 of the Technical Specification.

93.9 SPARE PARTS AND INSTRUCTION MANUALS

Provide a list of recommended spare parts and special tools for those items which are Contractor furnished, together with parts lists and instruction manuals necessary to maintain and service provided equipment and accessories in accordance with the requirements of Sections 86 and 100 of the Technical Specification.

93.10 TESTS, TRIALS AND INSPECTIONS

ATTENTION: **Prior** to powering up any OFE radio or cabinet, the Contractor shall present the completed installation to WSF for system and hook up checks. This check point shall be considered a major milestone hold point as defined in the *Major Production Milestone Hold Points* Subsection in Section 1 of the Technical Specification.

Tests and/or Trials shall be in accordance with this Section and Section 101 of the Technical Specification.

Inspections shall be performed as defined in this Section and in Sections 1 and 2 of the Technical Specification.

93.11 PHASE II TECHNICAL PROPOSAL REQUIREMENTS

The deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase II Technical Proposal stage of Work in accordance with the requirements of Section 100 of the Technical Specification.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

93.12 PHASE III DETAIL DESIGN AND CONSTRUCTION REQUIREMENTS

The deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase III Detail Design stage of Work in accordance with the requirements of Section 100 of the Technical Specification.

All testing, inspections and certifications shall be provided to assist WSF in obtaining FCC and other Authoritative Agencies licenses and approvals.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

(END OF SECTION)